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## TABLE OF CONTENTS.

HINE—Ohio Species of Mice .....	65
DETMERS—Medicinal Plants of Ohio (concluded) .....	73
VICKERS—List of Ferns of Mahoning Co. with Special Reference to Mill Creek Park .....	86

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## OHIO SPECIES OF MICE.

JAMES S. HINE.

Two different papers enumerating the Ohio species of mammals known as mice have been published. Jared P. Kirtland, in the Ohio Geological Survey Report for 1838, named four species as follows: house mouse, common white-footed mouse, jumping mouse and the meadow mouse. All of these are common in the state today, although the jumping mouse is reported as rare in some localities, but in other localities it certainly is rather plentiful. About the year 1878 A. W. Brayton of Irvington, Indiana furnished the manuscript for a report on the Mammals of Ohio, in which he listed the house mouse, white-footed mouse, rice field mouse, pine mouse, common meadow mouse, prairie meadow mouse, and jumping mouse. Two other species, namely: Cooper's mouse and the northern golden mouse were mentioned as of probable occurrence within our limits. There appears to be some mistake about the record for the prairie meadow mouse for no specimens have been reported in recent years and the material on which Brayton bases his record turns out to be the pine or mole mouse. Cooper's mouse has been taken in various parts of the state and in some places is known to be common, but no record for the golden mouse is yet reported. Of the nine species mentioned by Brayton therefore, further records of seven are at hand. Brayton's paper was published in the Report of the Ohio Geological Survey, 1882, Volume IV.

The collecting that has been done in more recent years has brought together Ohio material of at least nine species and varieties, while the work in adjoining and neighboring states suggests the possibility that four or more additional may be procured when further work has been done and all favorable localities investigated.

As time passes mammals of many kinds are more and more reduced on account of the clearing and cultivation of the land. A number of the larger species are already extirpated so far as the state is concerned and others are destined. An effort is being made at present to get together the records in regard to the species of Ohio mammals and to add species as well as records with a view to publishing an annotated list. We have a good representation of many species in the museum at present and it is desired to add others. I take this opportunity to state that we shall be glad to get specimens and records from any part of Ohio, especially of the larger species and such small ones as are considered of rare occurrence within our limits. The porcupine, wild cat, badger, deer and others of very uncommon occurrence may still be in the state if one happens to find them. All these have been taken in Ohio in former years, but there are a number of small animals that are suspected of inhabiting the state that have never been reported. Bats, mice and shrews are suggested as groups in which additions are most likely in our fauna.

A list of Ohio mice as at present constituted follows:

**Zapus hudsonius** (Zimmerman). Hudson Bay Jumping Mouse. A few specimens of this species have been taken in the state although there is some trouble in separating them from specimens of the following subspecies. Preble, in N. A. Fauna 15, reports one from Portland Station, Mahoning county and there is one in the O. S. U. museum from Ira, Summit county.

**Zapus hudsonius americanus** (Barton). Meadow Jumping Mouse. One belittles these interesting little animals by calling them by the mean and unrespected name of mice but the custom is so well established that it is not likely to be changed. They are easily known among Ohio mammals by their jumping or bounding mode of locomotion with which are associated very long hind legs and tail. The variety is slightly smaller and the dorsal dark area is not so distinct as in the typical species. The two are not easily told apart in the state for it seems that Ohio is largely in the section where they intergrade. In parts of the Western Reserve the meadow jumping mouse is common and one meets with specimens in various situations and under various conditions. Grass land is one of their favorite haunts but they are often seen in grain fields and in weed covered areas. It is not uncommon to start them while mowing or raking hay and in stubble ground they may be ploughed out while preparing fields for wheat. The number of young in a brood is variable no doubt but four is the number observed by myself. These quite early have nearly the color of their parents, although for some time, in fact until they are nearly full grown, the young are slightly lighter, especially is

this true of the dorsal area. Miller says that "their food appears to consist, like that of the other outdoor mice, largely of grass seeds, undoubtedly varied at times by the addition of berries and mushrooms and probably insects." When one comes upon them in the field they attempt to get out of the way by leaping although are not always able to direct their jumps in such a way as to make them beneficial for after making a dozen leaps a specimen may be very close to the starting point. At other times they bound away in the opposite direction from danger and are able to hide themselves very quickly and very securely. The winter is spent in a dormant condition beneath the ground. Although some observers have reported seeing specimens during mild weather of winter, others claim that often six months or more of the year is spent in the hibernating condition, making the observation that specimens plowed out in May in one case were still in a dormant state.

I have not seen any statement to the effect that these animals are injurious in any way, neither have I observed that they have any habits which would lead one to think that they have economic value. I consider them worthy of the sympathy of mankind, however, because of their unusual habits which are so different from other mammals in the region which they inhabit. They have numerous enemies among birds of prey and they do not appear to be very well prepared to evade cats and some other mammals that feed on the same kind of food.

**Microtis pennsylvanicus** (Ord). Meadow mouse. In his paper on An Economic Study of Field Mice, Lantz places this species at the head of the list. I am not sure of his reason for this or whether he intends by so doing to convey to his readers that it is of more importance from an economic standpoint than its relatives of the same genus, but as it is the most common short tailed mouse in Ohio we do not hesitate to accuse it of doing more damage along certain lines than any other rodent that shares with it the name which only has to be mentioned in order to designate its bearer as an enemy. The species may be known from other short tailed mice of the state by several characters. In the first place the tail is near two inches in length while in other short tailed mice the tail is less than an inch in length. Full grown specimens are larger and the color differs from others. Different specimens of the species vary in color more or less however, so this alone is not to be depended upon as a conclusive guide.

When a field grows up to June grass in the after part of the season and when winter comes this grass falls over and forms a carpet for the ground an ideal condition for meadow mice is produced. Here the mice form runways among the grass above the surface and in the ground beneath the surface so that they

can get out of the way easily in case of danger. If such a condition occurs in a waste field the mice live on roots largely and no noticeable damage results. In the burrows here and there quantities of dried grass is carried together and nests constructed where the adults spend much of their time and where the young are born. A brood of young usually consists of from four to six but they only remain under the direct care of the mother for a short time before they are able to go out and shift for themselves. Several broods are often produced in a season therefore and the species is enabled to multiply rapidly and thus it is a fact that a piece of ground with the desired conditions is very soon the home of large numbers of the rodents which in order to occupy the time and procure sufficient food are liable to get into all sorts of mischief. These conditions often exist in an orchard where the sod mulch system is practiced and if something is not done to protect the trees immense damage may result from the mice gnawing the bark from the trees near the ground, or sometimes just beneath the surface. These circumstances are illustrated in a recent bulletin by the Ohio Agricultural Experiment Station with a full treatment of the methods of protecting young trees.

Grain that is cut and placed in shocks in the field often receives more or less injury from this same mouse which is accused also of following in the burrows of moles and eating planted corn and other grains and seeds. In the case of wheat and other grain that is tied with twine the mice often get into the shocks and cut the bands, especially if this grain from any cause has to be left standing in the field longer than is usual.

**Microtus pinetorum scalopsoides** Audubon and Bachman. Northern Pine Mouse. An attractive species with a much shorter tail than the meadow mouse. The typical species is southern, the first recorded specimens having been taken in the pine forests of Georgia. Two varieties are recognized, *scalopsoides* and *auricularis*, both of which have a distribution that includes part of Ohio at least. I have seen a number of Ohio specimens from Hamilton and Madison counties, some of those from the first named county appear to be the specimens that were taken for the prairie meadow mouse by Brayton and are the basis of the recorded occurrence of that species in the state. I saw the specimens in the Cincinnati Society of Natural History museum. I cannot conclude that any of these specimens studied are the variety *auricularis* although Vernon Bailey records a specimen of this mouse from Brookville, Indiana, a few miles from Cincinnati. Further collecting may add *auricularis* to the list of Ohio mammals. The northern pine mouse appears quite different from the meadow mouse in the field but may inhabit similar situations. The fully adult specimens are browner and

sleeker and smaller in size and the tail is only about half as long as in that species. While collecting in Madison county a colony of the northern pine mouse was found in a pasture where the grass had grown rather high. As this was the 20th of November preparations had been made for winter evidently. I could not determine the number of specimens in the colony, but four of different ages were taken and there were evidences of others. Their nest was located under a split log lying with the flat side down and was composed of a quantity of soft grass with evidences of food material here and there. Runways led from the nest in various directions so that the mice had easy access to a supply of roots and other vegetable food in the vicinity. One of the specimens taken, a male, is adult and fully colored, a second specimen, also a male, is nearly adult size but the pelage is that of an immature individual, the other two are immature, not more than half grown.

**Synaptomys cooperi** Baird. Cooper Mouse. This species even has a shorter tail than the pine mouse and differs from all mice of the genus *Microtus* in having the upper front teeth grooved. The species in the field has a grayish appearance with the under parts clearly lighter. It is quite widely distributed in the state and in places is common. It occurs in nearly the same situations as the meadow mouse and in one field at London, Madison county, all three of the short-tailed mice here considered were taken on the same date and within the space of a few square rods. In Summit county I located a nest of this species on top of the ground and anchored in a bunch of clover. This nest only contained two young which were observed often until they grew large enough to run; two young is common in the species which would indicate that it is not as prolific as the meadow mouse. The species is met with commonly by turning logs in fields and thin woods but is not confined to such situations.

**Peromyscus leucopus noveboracensis** (Fisher). Common White-footed Mouse. There are at least thirteen variations of *P. leucopus* recognized and named from different parts of North America. Most of eastern United States is included within this range and subspecies reach Arizona, Montana and Yucatan. The species was described by Rafinesque from specimens taken in western Kentucky, a region where two forms appear to intergrade making it necessary to apply the species name to specimens that are to some extent intermediate. Rafinesque's name has been applied to the form which has the more southern range while the form that is uniformly distributed over Ohio is given the subspecies name *noveboracensis*. Recently Osgood has published an exhaustive treatment of the genus *Peromyscus* giving full information regarding all subspecies. This paper is one of

the most complete so far published on a genus of North American mammals, and as the author examined more than 27000 specimens in preparing the work we may at once conclude that all matters concerned received full consideration.

The species has many attractive habits and is seldom injurious so has not received the ill will of man to the extent that many of the other mice have. A variety of food is acceptable and they are sometimes induced to enter buildings to feed but as a usual thing are woodland animals and are found around logs and stumps in such places. It is not uncommon however to come across specimens in fields or along fence rows wherever stumps, piles of rails and various kinds of rubbish are to be found. In the woods they feed on acorns and nuts and also eat many insects. In the fields they visit grain shocks but this habit seems not to be common like it is in the house mouse and the meadow mouse.

Until in recent years this has been the only white-footed mouse known in Ohio so it has been easy to make determinations but quite recently it has been found that one of the varieties of *P. maniculatus* reaches our territory and matters have become somewhat more complicated. Adult specimens of the species are decidedly larger than those of the variety of *maniculatus* but when it comes to the young in gray pelage it is easy to be mistaken. It is soon observed that when one begins collecting white-footed mice in any locality in the state he soon brings together a large variety of coloration; not many distinct colors but specimens with grays and browns variously distributed over the body. This condition is almost entirely due to the age of the specimens; the young are gray and the fully adults are yellowish brown above with pure white under parts while specimens in the process of changing from the young to the adult pelage combine these colors with no apparent regard for system.

This species appears to care for its young better than other mice and it is not uncommon to observe it undertaking to move these to places of safety when danger threatens. It is a popular species under domesticated conditions readily adapting itself to circumstances.

**Peromyscus maniculatus bairdi** (Hoy and Kennicott) Prairie White-footed Mouse. The type locality for *P. maniculatus* is Labrador and the typical species is confined to that latitude as far west as the Mississippi River, but varieties to the number of thirty-five are recognized and one or more of these are to be found in many localities throughout North America. The variety *bairdi* was first taken at Bloomington, Illinois but is known at the present time to range from central Kansas

on the west nearly to central Ohio on the east. The first specimens recorded for the state were taken at London, Madison county where a male and female and three young were procured in 1906. These specimens were all together under a log but there was no indication of a nest near at hand. The prairie white-footed mouse is distinctly smaller than the common white-footed species, color darker, ears and feet smaller and the tail much shorter. When one has an acquaintance with both they appear very distinct, but the difference is not conspicuous enough to prevent confusion at all times. Osgood includes all of western Ohio within the range of this mouse.

In most of the recent publications including this variety it is treated as *Peromyscus michiganensis* (Audubon and Bachman), but Osgood shows that this is not correct.

**Oryzomys palustris** (Harlan). Rice-field Mouse. This animal is called a rat by some authors but as the only difference that exists between a rat and a mouse is a matter of size, it is just as acceptable to call it a mouse as many do. In size close to that of a half grown common rat and appearing much like that animal, although the tail is longer, the coloration browner and there is a white fringe of hairs on the lower part of the ear.

The Ohio records of this species are rather meager but there is conclusive evidence that it once inhabited the state, even though it may not at the present time. Brayton has the following to say: "It has been identified by Mr. Frank Langdon with some hesitation, on the strength of the posterior half of a small rat taken from the stomach of a hawk at Madisonville, Ohio." Brayton afterward examined the specimen and found the feet and tail answered the description of the rice-field mouse in detail.

Professor W. C. Mills while engaged in directing excavations at Baum Village Site near Chillicothe, Ohio, procured dozens of the skulls of this species at different depths. He states that other parts of the skeletons were observed and that it appeared as if the mice had died in their burrows. There is no way of deciding as to the age of these remains and so it cannot be stated what the relation to their surroundings might have been. I give these peculiar records because it is desired that any one in a position to give information on the rice-field mouse in Ohio may know the facts and if possible aid us in procuring more convincing proof.

**Mus musculus** Linnaeus. House Mouse. The members of the genus *Mus* which includes the house mouse, brown rat and black rat are all introduced into America and are the very worst of household pests. They are likely to multiply rapidly in any place where food products are stored or where they can find

anything to eat. The house mouse is distributed in most inhabited regions of the world. It was introduced into America from Europe almost with the first settlers from the latter country. Its original home is said to be southern Asia from whence it has been carried on ship-board to all the land areas and then across country by different modes of travel until it has reached its present distribution. This species, although so widely distributed, is uniform in its characters which designate it and differences in environment seem to change it in no perceivable way, as if it has developed characters which are perfectly fitted to the conditions under which the various specimens live. An interesting comparison along this line may be made with some of the American species of white-footed mice. A species that is widely distributed over the continent exists in thirty-five different recognized varieties but the house mouse distributed all over the world is *Mus musculus* everywhere.

Species that may be looked for in Ohio are the following:

**Zapus insignis** Miller. Woodland Jumping Mouse. Has been taken in western Pennsylvania and may be expected in eastern Ohio. Size larger than the meadow jumping mouse, ears longer and coloration paler. Premolar teeth are present in the other species of jumping mice but absent in this one. The species is an inhabitant of deep woods rather than meadows and fields.

**Microtus austerus** (LeConte). Prairie Meadow Mouse. Reported from Indiana, and possibly is a resident of western Ohio. Brayton reported this species, but as near as can be determined his specimens were the northern pine mouse. It may be known from the common meadow mouse by the slightly shorter tail and the grayer coloration as well as by the pelage appearing coarser.

**Evotomys gapperi** (Vigors). Red-backed Mouse. Known from Pennsylvania and if procured in Ohio the northeastern part of the state most likely will furnish it. The species is said to inhabit low woodlands and swamps and to remain in such situations nearly all the time. The species is a near relative of the common meadow mouse, but smaller and with a chestnut color which usually serves to distinguish it readily.

**Peromyscus nuttalli** (Harlan). Northern Golden Mouse. Specimens are known from central Kentucky and Rev. W. F. Henninger believes it is to be found in southern Ohio. The color of this mouse at all ages is suggested by the name and is a distinguishing characteristic. It is reported as partial to low ground, and, as a usual thing, is not abundant anywhere within its range.